AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claim 1. (Canceled)

2. (Currently amended) A ~~The~~ vane pump comprising:~~according to claim 1, wherein:~~

a housing that includes:

a rotor chamber that is defined within the housing and has one of a circular cross section and an ellipsoidal cross section;

an inlet that communicates between inside and outside of the rotor chamber;

at least one outlet that communicates between inside and outside of the rotor chamber; and

a discharge groove that is recessed in the housing and is exposed to the rotor chamber to communicate between the rotor chamber and the at least one outlet;

a rotor that is rotatably received in the rotor chamber and has a plurality of vane grooves, which are arranged along an outer peripheral wall surface of the rotor and extend radially inwardly from the outer peripheral wall surface of the rotor; and

a plurality of vanes, each of which is radially reciprocably received in a corresponding one of the vane grooves of the rotor and is urged against an inner peripheral wall surface of the housing during rotation of the rotor, wherein:

each pair of adjacent vanes defines a pump chamber therebetween in a rotational direction of the rotor between the inner peripheral wall surface of the housing and the outer peripheral wall surface of the rotor;

a volume of each pump chamber changes when the rotor is rotated;

the inlet is communicated with each corresponding pump chamber to supply working fluid into the pump chamber when the volume of the pump chamber is increased upon rotation of the rotor;

the at least one outlet is communicated with each corresponding pump chamber through the discharge groove to discharge working fluid from the pump chamber when the volume of the pump chamber is decreased upon rotation of the rotor;

the discharge groove includes a first end and a second end, wherein the second end of the discharge groove is positioned away from the first end of the discharge groove in the rotational direction of the rotor; and

the at least one outlet extends directly from the second end of the discharge groove;

the discharge groove includes a first end wall surface and a second end wall surface which are opposed to one another in the rotational direction of the rotor and extend generally parallel to a rotational axis of the rotor, wherein the first end wall surface is located in the first end of the discharge groove, and the second end wall surface is located in the second end of the discharge groove;

the outlet includes an inner wall surface, which extends from the second end of the discharge groove and is generally parallel to the rotational axis of the rotor; and

the second end wall surface of the discharge groove is flush with a closest portion of the inner wall surface of the outlet, which is closest to the second end wall surface of the discharge groove.

3. (Currently amended) A ~~The~~ vane pump comprising:~~according to claim 1, wherein:~~

a housing that includes:

a rotor chamber that is defined within the housing and has one of a circular cross section and an ellipsoidal cross section;

an inlet that communicates between inside and outside of the rotor chamber;

at least one outlet that communicates between inside and outside of the rotor chamber; and

a discharge groove that is recessed in the housing and is exposed to the rotor chamber to communicate between the rotor chamber and the at least one outlet;

a rotor that is rotatably received in the rotor chamber and has a plurality of vane grooves, which are arranged along an outer peripheral wall surface of the rotor and extend radially inwardly from the outer peripheral wall surface of the rotor; and

a plurality of vanes, each of which is radially reciprocably received in a corresponding one of the vane grooves of the rotor and is urged against an inner peripheral wall surface of the housing during rotation of the rotor, wherein:

each pair of adjacent vanes defines a pump chamber therebetween in a rotational direction of the rotor between the inner peripheral wall surface of the housing and the outer peripheral wall surface of the rotor;

a volume of each pump chamber changes when the rotor is rotated;

the inlet is communicated with each corresponding pump chamber to supply working fluid into the pump chamber when the volume of the pump chamber is increased upon rotation of the rotor;

the at least one outlet is communicated with each corresponding pump chamber through the discharge groove to discharge working fluid from the pump chamber when the volume of the pump chamber is decreased upon rotation of the rotor;

the discharge groove includes a first end and a second end, wherein the second end of the discharge groove is positioned away from the first end of the discharge groove in the rotational direction of the rotor; and

the at least one outlet extends directly from the second end of the discharge groove;

the discharge groove includes a first end wall surface and a second end wall surface which are opposed to one another in the rotational direction of the rotor and extend generally parallel to a rotational axis of the rotor, wherein the first end wall

surface is located in the first end of the discharge groove, and the second end wall surface is located in the second end of the discharge groove;

the outlet includes an inner wall surface, which extends from the second end of the discharge groove and is generally parallel to the rotational axis of the rotor;

the second end wall surface of the discharge groove is spaced away from a closest portion of the inner wall surface of the outlet, which is closest to the second end wall surface of the discharge groove, in the rotational direction of the rotor; and

a distance between the second end wall surface of the discharge groove and the closest portion of the inner wall surface of the outlet in the rotational direction of the rotor is equal to or smaller than an axial extent of the second end wall surface of the discharge groove in the direction generally parallel to the rotational axis of the rotor.

4. (Currently amended) A ~~The~~ vane pump comprising:~~according to claim 1, wherein:~~

a housing that includes:

a rotor chamber that is defined within the housing and has one of a circular cross section and an ellipsoidal cross section;

an inlet that communicates between inside and outside of the rotor chamber;

at least one outlet that communicates between inside and outside of the rotor chamber; and

a discharge groove that is recessed in the housing and is exposed to the rotor chamber to communicate between the rotor chamber and the at least one outlet;

a rotor that is rotatably received in the rotor chamber and has a plurality of vane grooves, which are arranged along an outer peripheral wall surface of the rotor and extend radially inwardly from the outer peripheral wall surface of the rotor; and

a plurality of vanes, each of which is radially reciprocably received in a corresponding one of the vane grooves of the rotor and is urged against an inner peripheral wall surface of the housing during rotation of the rotor, wherein:

each pair of adjacent vanes defines a pump chamber therebetween in a rotational direction of the rotor between the inner peripheral wall surface of the housing and the outer peripheral wall surface of the rotor;

a volume of each pump chamber changes when the rotor is rotated;

the inlet is communicated with each corresponding pump chamber to supply working fluid into the pump chamber when the volume of the pump chamber is increased upon rotation of the rotor;

the at least one outlet is communicated with each corresponding pump chamber through the discharge groove to discharge working fluid from the pump chamber when the volume of the pump chamber is decreased upon rotation of the rotor;

the discharge groove includes a first end and a second end, wherein the second end of the discharge groove is positioned away from the first end of the discharge groove in the rotational direction of the rotor; and

the at least one outlet extends directly from the second end of the discharge groove;

the discharge groove includes a first end wall surface and a second end wall surface which are opposed to one another in the rotational direction of the rotor and extend generally parallel to a rotational axis of the rotor, wherein the first end wall surface is located in the first end of the discharge groove, and the second end wall surface is located in the second end of the discharge groove;

the outlet includes an inner wall surface, which extends from the second end of the discharge groove and is generally parallel to the rotational axis of the rotor; and

a closest portion of the inner wall surface of the outlet, which is closest to the second end wall surface of the discharge groove is spaced away from the second end wall surface of the discharge groove in the rotational direction of the rotor.

Claims 5-6. (Cancelled)

7. (Currently amended) A ~~The~~ vane pump comrprising:~~according to claim 5, wherein~~

a housing that includes:

a rotor chamber that is defined within the housing and has one of a circular cross section and an ellipsoidal cross section;

an inlet that communicates between inside and outside of the rotor chamber;

at least one outlet that communicates between inside and outside of the rotor chamber; and

a discharge groove that is recessed in the housing and is exposed to the rotor chamber to communicate between the rotor chamber and the at least one outlet;

a rotor that is rotatably received in the rotor chamber and has a plurality of vane grooves, which are arranged along an outer peripheral wall surface of the rotor and extend radially inwardly from the outer peripheral wall surface of the rotor; and

a plurality of vanes, each of which is radially reciprocably received in a corresponding one of the vane grooves of the rotor and is urged against an inner peripheral wall surface of the housing during rotation of the rotor, wherein:

each pair of adjacent vanes defines a pump chamber therebetween in a rotational direction of the rotor between the inner peripheral wall surface of the housing and the outer peripheral wall surface of the rotor;

a volume of each pump chamber changes when the rotor is rotated;

the inlet is communicated with each corresponding pump chamber to supply working fluid into the pump chamber when the volume of the pump chamber is increased upon rotation of the rotor;

the at least one outlet is communicated with each corresponding pump chamber through the discharge groove to discharge working fluid from the pump chamber when the volume of the pump chamber is decreased upon rotation of the rotor;

the discharge groove includes a first end and a second end, wherein the second end of the discharge groove is positioned away from the first end of the discharge groove in the rotational direction of the rotor; and

the at least one outlet extends directly from the second end of the discharge groove;

upon installation of the vane pump, the second end of the discharge groove is placed below the first end of the discharge groove in a vertical direction, and the outlet is oriented generally in the direction of gravity; and

the outlet includes an inner wall surface, and at least a portion of the inner wall surface of the outlet extends in a direction that is tangent to rotation of the rotor.

8. (Currently amended) A ~~The~~ vane pump comprising:~~according to claim 1, wherein:~~

a housing that includes:

a rotor chamber that is defined within the housing and has one of a circular cross section and an ellipsoidal cross section;

an inlet that communicates between inside and outside of the rotor chamber;

at least one outlet that communicates between inside and outside of the rotor chamber; and

a discharge groove that is recessed in the housing and is exposed to the rotor chamber to communicate between the rotor chamber and the at least one outlet;

a rotor that is rotatably received in the rotor chamber and has a plurality of vane grooves, which are arranged along an outer peripheral wall surface of the rotor and extend radially inwardly from the outer peripheral wall surface of the rotor; and

a plurality of vanes, each of which is radially reciprocably received in a corresponding one of the vane grooves of the rotor and is urged against an inner peripheral wall surface of the housing during rotation of the rotor, wherein:

each pair of adjacent vanes defines a pump chamber therebetween in a rotational direction of the rotor between the inner peripheral wall surface of the housing and the outer peripheral wall surface of the rotor;

a volume of each pump chamber changes when the rotor is rotated;

the inlet is communicated with each corresponding pump chamber to supply working fluid into the pump chamber when the volume of the pump chamber is increased upon rotation of the rotor;

the at least one outlet is communicated with each corresponding pump chamber through the discharge groove to discharge working fluid from the pump chamber when the volume of the pump chamber is decreased upon rotation of the rotor;

the discharge groove includes a first end and a second end, wherein the second end of the discharge groove is positioned away from the first end of the discharge groove in the rotational direction of the rotor; and

the at least one outlet extends directly from the second end of the discharge groove;

the at least one outlet includes first and second outlets;

the first outlet extends generally parallel to a rotational axis of the rotor; and

the second outlet extends generally perpendicular to the rotational axis of the rotor.

Claims 9-10. (Canceled)

11. (Currently amended) A ~~The~~ vane pump comprising: ~~according to claim 9, wherein:~~

a housing that includes a ring and first and second plates, wherein the first and second plates are engaged with first and second axial ends, respectively, of the ring, and the ring includes:

a ~~the~~ rotor chamber that is defined radially inward of the ring~~; and the inlet, the outlet and the discharge groove are provided in the ring~~ and has one of a circular cross section and an ellipsoidal cross section;

an inlet that communicates between inside and outside of the rotor chamber;

at least one outlet that communicates between inside and outside of the rotor chamber; and

a discharge groove that is recessed in the ring and is exposed to the rotor chamber to communicate between the rotor chamber and the at least one outlet;

a rotor that is rotatably received in the rotor chamber and has a plurality of vane grooves, which are arranged along an outer peripheral wall surface of the rotor and extend radially inwardly from the outer peripheral wall surface of the rotor; and

a plurality of vanes, each of which is radially reciprocably received in a corresponding one of the vane grooves of the rotor and is urged against an inner peripheral wall surface of the ring during rotation of the rotor, wherein:

each pair of adjacent vanes defines a pump chamber therebetween in a rotational direction of the rotor between the inner peripheral wall surface of the ring and the outer peripheral wall surface of the rotor;

a volume of each pump chamber changes when the rotor is rotated;

the inlet is communicated with each corresponding pump chamber to supply working fluid into the pump chamber when the volume of the pump chamber is increased upon rotation of the rotor;

the at least one outlet is communicated with each corresponding pump chamber through the discharge groove to discharge working fluid from the pump chamber when the volume of the pump chamber is decreased upon rotation of the rotor;

the discharge groove includes a first end and a second end, wherein the second end of the discharge groove is positioned away from the first end of the discharge groove in the rotational direction of the rotor; and

the at least one outlet extends directly from the second end of the discharge groove.

12. (Original) A vane pump comprising:

a housing that includes:

a rotor chamber that is defined within the housing and has one of a circular cross section and an ellipsoidal cross section;

an inlet that communicates between inside and outside of the rotor chamber;

an outlet that communicates between inside and outside of the rotor chamber; and

a discharge groove that is recessed in the housing and is exposed to the rotor chamber to communicate between the rotor chamber and the outlet;

a rotor that is rotatably received in the rotor chamber and has a plurality of vane grooves, which are arranged along an outer peripheral wall surface of the rotor and extend radially inwardly from the outer peripheral wall surface of the rotor; and

a plurality of vanes, each of which is radially reciprocably received in a corresponding one of the vane grooves of the rotor and is urged against an inner peripheral wall surface of the housing during rotation of the rotor, wherein:

each pair of adjacent vanes defines a pump chamber therebetween in a rotational direction of the rotor between the inner peripheral wall surface of the housing and the outer peripheral wall surface of the rotor;

a volume of each pump chamber changes when the rotor is rotated;

the inlet is communicated with each corresponding pump chamber to supply working fluid into the pump chamber when the volume of the pump chamber is increased upon rotation of the rotor;

the outlet is communicated with each corresponding pump chamber through the discharge groove to discharge working fluid from the pump chamber when the volume of the pump chamber is decreased upon rotation of the rotor;

the discharge groove includes a first end and a second end, wherein the second end of the discharge groove is positioned away from the first end of the groove in the rotational direction of the rotor;

the outlet extends generally in a direction of gravity from an intermediate point between the first end and the second end of the discharge groove; and

the discharge groove is sloped in the direction of gravity from both the first end and second end of the discharge groove toward the outlet.

13. (Original) The vane pump according to claim 12, wherein the vane pump is constructed to be used in such a manner that a rotational axis of the rotor is oriented in a vertical direction, so that the discharge groove is sloped in the direction of gravity from both the first end and second end of the discharge groove toward the outlet.